UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,173	04/01/2004	Shyh-Hsing Wang	3313-1143PUS1	7367

2292 7590 03/05/2009

BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER	
CRUZ, IRIANA	
ART UNIT	PAPER NUMBER
2625	

NOTIFICATION DATE	DELIVERY MODE
03/05/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/814,173	WANG ET AL.	
	Examiner	Art Unit	
	IRIANA CRUZ	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 December 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15 and 18-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15 and 18-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *01/16/2008,05/18/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 12/08/2008, with respect to the rejection(s) of claim(s) 1 and 12 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Katsuyama (US Patent Number 7,268,919 B2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 5-7 and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshito (JP Publication Number 2002-027249) in view of Katsuyama (US Patent Number 7,268,919 B2).

Regarding **Claim 1**, Yoshito'249 shows a memory management method for error diffusion comprising the steps of: dividing an image to be processed into a plurality of blocks **(i.e., an input image is divided into a plurality of blocks side by side. See Paragraphs 11-14 and See Figure 2)**; filling an initial region of a block according to an error diffusion method **(i.e., the blocks are generated/filled with error diffusion to the near block of each block ((in order from first to last)). See Paragraph 11-14 and 43)**; performing error diffusion in order for each of the pixels in the block **(i.e., blocks contains pixels, and the error diffusion is calculated for the blocks. See**

Paragraph 11-14, 29 and 43); and performing the error diffusion method for each of the blocks to complete halftone processing **(i.e., Half toning equipment to perform error diffusion. See Paragraph 13)**.

Yoshito'249 fails to specifically show the memory management method reserving the pixels that are not processed in the final region of the block to the next adjacent block.

Katsuyama'919 teaches a memory management method reserving the pixels that are not processed in the final region of the block to the next adjacent block **(i.e., each block can be divided further considered as a group, the error diffusion is done from top left block and sequentially proceeds to the rest of the pixels/blocks, the original divided block while the top left part is being processed the part of the block that hasn't been done yet at that moment is considered to be part of the processed block that will be done next as the beginning of another block. See Column 30, Lines 51-67 also See Figures 6 and 9)**.

Having the system of Yoshito'249 and then given the well-established teaching of the Katsuyama'919, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the system as suggested by the combination of Yoshito'249 with the teachings of Katsuyama'919 by adding memory management method reserving the pixels that are not processed in the final region of the block to the next adjacent block, in order to accelerate image data conversion through the use of error diffusion see abstract.

Regarding **Claim 5**, Yoshito'249 shows a method wherein the step of dividing an image to be processed into a plurality of blocks divides the image into a plurality of arrayed blocks **(i.e., an input image is divided into blocks side by side. See Paragraph 11 and See Figure 2)**.

Regarding **Claim 6**, Yoshito'249 shows a method wherein the arrayed blocks are regular rectangular blocks **(i.e., the input image is divided into rectangular block. See Paragraph 14)**.

Regarding **Claim 7**, Yoshito'249 shows a method wherein the step of dividing an image to be processed into a plurality of blocks divides according to the error diffusion method **(i.e., the image is divide in blocks where each block has its error diffusion calculated to the near block henceforth. See Paragraph 11-13)**.

Regarding **Claim 9**, Yoshito'249 shows a method wherein the step of filling an initial region of a block according to an error diffusion method filling the initial region of the block with required image data so that the pixels in the initial region are to be error diffused **(i.e., error diffusion is performed in each block and is offset to the next one following an order. See Paragraphs 12-13, 32 and 51)**.

Regarding **Claim 10**, Yoshito'249 shows a method wherein the image data being filled are pixels that are not processed in its adjacent blocks **(i.e., the blocks are filled in order, the pixels that did not made it into the previous block will be used to fill the next block. See Paragraphs 32 and 51)**.

Claims 2-4, 8, 11-15, 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshito (JP Publication Number 2002-027249) in view of Katsuyama

(US Patent Number 7,268,919 B2) and further in view of Hattori (US Publication 2003/0123093 A1).

Regarding **Claim 2**, the combination of Yoshito'249 and Katsuyama'919 fails to show a method wherein the size of each divided block is smaller than the size of memory.

Hattori'093 teaches a method wherein the size of each divided block is smaller than the size of memory **(i.e., the tiles/blocks are stored in a memory, in order to be saved they have to be smaller in size than the memory. See Paragraph 31)**.

Having the system of Yoshito'249 and Katsuyama'919 and then given the well-established teaching of the Hattori'093, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the system of Yoshito'249 and Katsuyama'919 as taught by the Hattori'093, since using it reduces the moire fringes and enable expression of high-quality multiple gradations for halftoning method as suggested in reference Hattori'093 Paragraph 10.

Regarding **Claim 3**, the combination of Yoshito'249, Katsuyama'919 and Hattori'093 show a method wherein the memory is an internal memory of an image processing chip **(i.e., halftoning circuit with internal memory. See Paragraph 145 in reference Hattori'093)**.

Regarding **Claim 4**, the combination of Yoshito'249, Katsuyama'919 and Hattori'093 teaches a method wherein the internal memory is static random access memory **(SRAM) (i.e., the internal memory used is an SRAM. See Paragraph 145 in reference Hattori'093).**

Regarding **Claim 8**, the combination of Yoshito'249, Katsuyama'919 and Hattori'093 shows a method wherein the block is an approximately zigzag shape **(i.e., a virtual tile ((division blocks)) is provided with different shapes/zigzag. See Paragraphs 31, 89 and 93 and See Figures 2C and 2D in reference Hattori'093).**

Regarding **Claim 11**, the combination of Yoshito'249, Katsuyama'919 and Hattori'093 shows a method wherein the image data being filled are empty pixels **(i.e., some blocks are filled with empty pixels. See Paragraph 9 and See Figure 3A and 3B in reference Hattori'093).**

Regarding **Claim 12**, Yoshito'249 shows a halftone processing module for error diffusion **(i.e., halftoning equipment to perform error diffusion. See Paragraph 13)** for dividing an image into a plurality of blocks **(i.e., an input image is divided into blocks side by side. See Paragraphs 11-14 and 43 also see Figure 2)** and using an error diffusion method to perform halftone processing **(i.e., halftoning equipment to perform error diffusion. See Paragraph 13)**, the module comprising: an image processing chip, which executes the error diffusion **(i.e., the halftoning equipment executes the error diffusion. See Paragraphs 13).**

Yoshito'249 fails to show the method where the filling image data being all pixels not processed in the final region of the block to the next adjacent block.

Katsuyama'919 teaches the method where the filling image data being all pixels not processed in the final region of the block to the next adjacent block **(i.e., each block can be divided further considered as a group, the error diffusion is done from top left block and sequentially proceeds to the rest of the pixels/blocks, the original**

divided block while the top left part is being processed the part of the block that hasn't been done yet at that moment is considered to be part of the processed block that will be done next as the beginning of another block. See Column 30, Lines 51-67 also See Figures 6 and 9).

Having the system of Yoshito'249 and then given the well-established teaching of the Katsuyama'919, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the system as suggested by the combination of Yoshito'249 with the teachings of Katsuyama'919 by adding memory management method reserving the pixels that are not processed in the final region of the block to the next adjacent block, in order to accelerate image data conversion through the use of error diffusion see abstract.

The combination of Yoshito'249 and Katsuyama'919 fails to show an internal memory which is inside the chip to store the block to be processed and the image data filling in the initial region of the block, and an external memory, which is outside the chip for providing the internal memory with the pixels needed to fill the block.

Hattori'093 teaches an internal memory which is inside the chip to store the block to be processed and the image data filling in the initial region of the block **(i.e., halftoning circuit with internal memory. See Paragraph 145)** and an external memory, which is outside the chip for providing the internal memory with the pixels needed to fill the block **(i.e., pixels are load from external image memory. See Paragraph 145)**.

Having the system of Yoshito'249 and Katsuyama'919 and then given the well-established teaching of the Hattori'093, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the system of Yoshito'249 and Katsuyama'919 as taught by the Hattori'093, since using it reduces the moire fringes and enable expression of high-quality multiple gradations for halftoning method as suggested in reference Hattori'093 Paragraph 10.

Regarding **Claim 13**, the combination of Yoshito'249, Katsuyama'919 and Hattori'093 teaches a halftone processing module wherein the internal memory is static random access memory (SRAM) **(i.e., the internal memory used is an SRAM. See Paragraph 145 in reference Hattori'093)**.

Regarding **Claim 14**, the combination of Yoshito'249, Katsuyama'919 and Hattori'093 shows the halftone processing module wherein the block to be processed has an approximately zigzag shape according to the error diffusion method **(i.e., a virtual tile ((division blocks)) is provided with different shapes/zigzag. See Paragraphs 31, 89 and 93 and See Figures 2C and 2D in reference Hattori'093)**.

Regarding **Claim 15**, the combination of Yoshito'249, Katsuyama'919 and Hattori'093 shows the halftone processing module wherein the image data filling in the initial region of the block are the image data that enable all the pixels in the initial region to be error diffused according to the error diffusion method **(i.e., error diffusion is performed in each block and is offset to the next one following an order. See Paragraphs 12-13, 32 and 51 in reference Yoshito'249).**

Regarding **Claim 18**, the combination of Yoshito'249, Katsuyama'919 and Hattori'093 show a halftone processing module wherein the image data being filled are empty pixels **(i.e., some blocks are filled with empty pixels. See Paragraph 9 and See Figure 3A and 3B in reference Hattori'093).**

Regarding **Claim 19**, the combination of Yoshito'249, Katsuyama'919 and Hattori'093 shows a halftone processing module wherein the external memory is dynamic random access memory (DRAM) **(i.e., the external image memory is an DRAM. See Paragraph 145 in reference Hattori'093).**

Regarding **Claim 20**, the combination of Yoshito'249, Katsuyama'919 and Hattori'093 shows a method wherein the initial region is filled with a initial filling region, and if the image being processed is a part of a whole image, the initial filling region is filled an adjacent image, otherwise, the initial filling region is filled with empty pixels **(i.e., some blocks are filled with empty pixels. See Paragraph 9 and See Figure 3A and 3B in reference Hattori'093)**.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IRIANA CRUZ whose telephone number is (571)270-3246. The examiner can normally be reached on Monday-Friday 7:30am to 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, King Y. Poon can be reached on (571) 272-7440. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/King Y. Poon/
Supervisory Patent Examiner, Art Unit 2625

Iriana Cruz
Examiner
Art Unit 2625

February 27, 2009

/I. C./
Examiner, Art Unit 2625